

MATTHEW D. SHUPE

Associate Scientist

Cooperative Institute for Research in Environmental Sciences and
the NOAA Earth Systems Research Laboratory

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EDUCATION:

University of Colorado, Currently in pursuit of Ph. D in Astrophysical, Planetary, and Atmospheric Sciences.

University of Colorado, M.S. Atmospheric and Ocean Sciences, 2006

University of Puget Sound, B.S. Summa Cum Laude, Chemistry with atmospheric sciences focus, second major Mathematics, 1997

PROFESSIONAL APPOINTMENTS:

Science and Technology Corporation and NOAA-Environmental Technology Laboratory,
research scientist; 1998 – 2004

Cooperative Institute for Research in Environmental Sciences, University of Colorado and
NOAA/ERSL; research assistant, 2004 – present.

RESEARCH AREAS:

Cloud microphysical and radiative properties, cloud retrieval validation, assessment of
cloud model parameterizations, cloud type classification, Arctic meteorology and climate.

FIELD EXPERIENCE:

July 2005: SEARCH project deployment in Eureka, Canada

October 2004: Mixed-Phase Arctic Clouds Experiment in Barrow, Alaska

July 2002: NASA-FIRE CRYSTAL- Florida Area Cirrus Experiment (South Florida)

Jan. 2000-Feb. 2000: High Altitude Weather Characterization Experiment (Boston)

March 1999: NOAA/ETL depolarization lidar (DABUL) in Barrow, Alaska.

Nov. 1997 – Oct. 1998: Surface Heat Budget of the Arctic Program (Arctic Ocean)

SPECIAL SKILLS:

Knowledgeable of Linux, Unix, and PC computer systems.

Proficient in IDL with a working knowledge of Matlab, Unix shell scripts, Perl, C.

HONORS AND AWARDS:

University of Puget Sound

Graduated Summa Cum Laude 1997

Graduated with Honors in Mathematics 1997

Campus Leadership Award 1997

Dean's List 1992, 1994-1997

Trustee Scholarship 1992-1997 (for academic performance)

Hearst Writing Award 1996 (for a mathematical modeling paper)

Fehlandt Scholarship Award 1996 (for outstanding Chemistry Student)
Hunter Memorial Scholarship: 1994-1996 (Highest GPA in Fraternity)
Goman Scholarship 1995 - 1996 (for outstanding Mathematics student)
Chemistry Dept. Scholarship 1995 (for outstanding Chemistry student)
Merck Index Award 1995 (for outstanding Organic Chemistry student)
Murdock Research Grant 1995

Other

NOAA-ETL Employee of the Month, June 2005

GRANTS FUNDED

“Using Radar, Lidar, and Radiometer Data from NSA and SHEBA to Quantify Cloud Property Effects on the Arctic Surface Heat Budget,” Janet Intrieri (PI) and Matthew Shupe (Co-PI), Department of Energy, Atmospheric Radiation Measurement Program, 2002-2004, \$209,400.

“An Investigation of the Microphysical, Radiative, and Dynamical Properties of Mixed-Phase Clouds,” Matthew Shupe (PI) and Pavlos Kollias (Co-PI), Department of Energy, Atmospheric Radiation Measurement Program, 2005-2007, \$100,800.

SCIENCE COMMITTEES AND ASSOCIATIONS:

ARM Science Team member

ARM Sunset Committee member

Member American Geophysical Union

AMS Polar Meteorology and Oceanography Committee, 2006-

REFEREED PUBLICATIONS:

Shupe, M.D., T. Uttal, S.Y. Matrosov, and A.S. Frisch, 2001: Cloud water contents and hydrometeor sizes during the FIRE-Arctic Clouds Experiment. *J. Geophys. Res.*, **106**, 15,015-15,028.

Hobbs, P.V., A.L. Rangno, M.D. Shupe, and T. Uttal, 2001: Airborne studies of cloud structures over the Arctic Ocean and comparisons with deductions from ship-based 35 GHz radar measurements. *J. Geophys. Res.*, **106**, 15 029-15 044.

Minnis, P., D.R. Doelling, V. Chakrapani, D.A. Spangenberg, L. Nguyen, R. Palikonda, T. Uttal, R.F. Arduini, and M. Shupe, 2001: Cloud coverage during FIRE ACE derived from AVHRR data. *J. Geophys. Res.*, **106**, 15,215-15,232.

Khvorostyanov, V.I., J.A. Curry, J.O. Pinto, M.D. Shupe, B.A. Baker, and K. Sassen, 2001: Modeling with explicit spectral water and ice microphysics of a two-layer cloud system of altostratus and cirrus observed during the FIRE Arctic Clouds Experiment. *J. Geophys. Res.*, **106**, 15,099-15,112.

Westwater, E.R., Y. Han, M. D. Shupe, and S. Y. Matrosov, 2001: Analysis of integrated cloud liquid and precipitable water vapor retrievals from microwave radiometers during SHEBA. *J. Geophys. Res.*, **106**, 32,019-32,030.

Uttal, T., J.A. Curry, M.G. McPhee, D.K. Perovich, R.E. Moritz, J.A. Maslanik, P.S. Guest, H.L. Stern, J.A. Moore, R. Turenne, A. Heiberg, M.C. Serreze, D.P. Wylie, O.G. Persson, C.A. Paulson, C. Halle, J.H. Morison, P.A. Wheeler, A. Makshtas, H. Welch, M.D. Shupe, J.M. Intrieri, K. Stamnes, R.W. Lindsey, R.

- Pinkel, W.S. Pegau, T.P. Stanton, and T.C. Grenfeld, 2002: Surface Heat Budget of the Arctic Ocean. *Bull. Amer. Meteor. Soc.*, **83**, 255-276.
- Rathke, C., J. Fischer, S. Neshyba, and M.D. Shupe, 2002: Improving IR cloud phase determination with 20 microns spectral observations. *Geophys. Res. Lett.*, **29**, 50.1-50.4.
- Frisch, A.S., M.D. Shupe, I. Djalalova, G. Feingold, and M. Poellot, 2002: The retrieval of stratus cloud droplet effective radius with cloud radars. *J. Atmos. Ocean. Tech.*, **19**, 835-842.
- Intrieri, J.M., M.D. Shupe, T. Uttal, and B.J. McCarty, 2002: Annual Cycle of Arctic Cloud Geometry and Phase from Radar and lidar at SHEBA. *J. Geophys. Res.*, **107** (C10), 10.1029/2000JC000423.
- Intrieri, J.M., C.F. Fairall, M.D. Shupe, O.G.P. Persson, E.L Andreas, P. Guest, and R.M. Moritz, 2002: Annual cycle of cloud forcing over the Arctic. *J. Geophys. Res.*, **107** (C10), 10.1029/2000JC000439.
- Schweiger, A., R Lindsay, J. Francis, J. Key, J. Intrieri, and M. Shupe, 2002: Validation of TOVS Path-P data during SHEBA. *J. Geophys. Res.*, **107**(C10), 10.1029/2000JC000453.
- Rathke, C., S. Neshyba, M.D. Shupe, P. Rowe, and A. Rivers, 2002: Radiative and microphysical properties of Arctic stratus clouds from multiangle downwelling infrared radiances, *J. Geophys. Res.*, **107**(D23), 4703, doi: 10.1029/2001JD001545.
- Loehnert, U., G. Feingold, T. Uttal, A.S. Frisch, and M.D. Shupe, 2003: Analysis of two independent methods to for retrieving liquid water profiles in spring and summer Arctic boundary clouds. *J. Geophys. Res.*, **108**(D7), 4219, doi:10.1029/2002JD002861.
- Morrison, H., M. D. Shupe, and J.A. Curry, 2003: Modeling clouds observed at SHEBA using a bulk microphysics parameterization implemented into a single-column model. *J. Geophys. Res.*, **108**(D8), 4255, doi:10.1029/2002JD002229.
- Matrosov, S.Y., M.D. Shupe, A.J. Heymsfield, and P. Zuidema, 2003: Ice cloud optical thickness and extinction estimates from radar measurements. *J. Appl. Meteor.*, **42**, 1584-1597.
- Shupe, M.D. and J.M. Intrieri, 2004: Cloud radiative forcing of the Arctic surface: The influence of cloud properties, surface albedo, and solar zenith angle. *J. Climate*, **17**, 616-628.
- Shupe, M. D., P. Kollias, S. Y. Matrosov, and T. L. Schneider, 2004: Deriving mixed-phase cloud properties from Doppler radar spectra. *J. Atmos. Ocean. Technol.*, **21**, 705-715.
- Intrieri, J.M., and M.D. Shupe, 2004: Characteristics and radiative effects of diamond dust over the Western Arctic Ocean region. *J. Climate*, **17**, 2953-2960.
- Zuidema, P., B. Baker, Y. Han, J. Intrieri, J. Key, P. Lawson, S. Matrosov, M. Shupe, R. Stone, and T. Uttal, 2005: An Arctic springtime mixed-phase cloudy boundary layer observed during SHEBA. *J. Atmos. Sci.*, **62**, 160-176.
- Sassen, K., J.R. Campbell, J. Zhu, P. Kollias, M.D. Shupe, and C. Williams, 2005: Lidar and triple-wavelength Doppler radar measurements of the melting layer: A revised model for dark- and brightband phenomena. *J. Appl. Meteor.*, **44**, 301-312.

- Morrison, H., J. A. Curry, M. D. Shupe, and P. Zuidema, 2005: A new double-moment microphysics parameterization, Part 2: Application to Arctic stratiform clouds. *J. Atmos. Sci.*, **62**, 1678-1693.
- Morrison, H., M.D. Shupe, J.A. Curry, and J.O. Pinto, 2005: Possible roles of ice nucleation mode and ice nuclei depletion in the extended lifetime of arctic mixed-phase clouds. *Geophys. Res. Lett.*, **32**, L18801, doi:10.1029/2005GL023614.
- Shupe, M.D., T. Uttal, and S. Y. Matrosov, 2005: Arctic cloud microphysics retrievals from surface-based remote sensors at SHEBA. *J. Appl. Meteor.*, **44**, 1544-1562.
- Shupe, M.D., S.Y. Matrosov, and T. Uttal, 2006: Arctic mixed-phase cloud properties derived from surface-based sensors at SHEBA. *J. Atmos. Sci.*, **63**, 697-711.